

## CLAIMS

What is claimed is:

1. An optical pickup system which outputs and controls power that drives a laser diode, comprising:

a monitor photo diode which detects an optical power output by the LD, and selects and applies an output gain to the detected optical power depending on a type of power that drives the laser diode so as to output an optical power monitoring signal for use by the optical pickup system in controlling the laser diode.

2. The optical pickup system of claim 1, wherein the monitor photo diode comprises a first gain for when a command is issued to output a preheating overpower to the laser diode and a second gain other than the first gain for when a command is issued to output a write or a read power to the laser diode.

3. The optical pickup system of claim 2, wherein the first gain is set so as to output a predetermined cut-off voltage for the detected optical power of substantially the preheating overpower.

4. The optical pickup system of claim 2, wherein the second gain is set to output a predetermined cut-off voltage for when the detected optical power is substantially the write power or the read power.

5. The optical pickup system of claim 1, wherein the monitor photo diode selects a greater gain when a command is issued to output a write or a read power to the laser diode than a gain when a command is issued to output a preheating overpower to the laser diode.

6. The optical pickup system of claim 2, wherein one of the first and second gains is selected according to a type of a power enable signal transmitted from an optical pickup controller for driving the laser diode.

7. The optical pickup system of claim 6, wherein the first gain is selected when the power enable signal is an overpower enable signal.

8. An apparatus for controlling a monitor photo diode, which monitors an optical signal output from a laser diode for writing data on or reading data from a disk, the apparatus comprising:

a comparator which compares a voltage signal corresponding to an optical power output from the laser diode with a predetermined reference voltage signal and outputs a difference signal; and

a gain selector which selectively issues a gain output from the comparator so as to provide a gain controlled signal for use in controlling the optical power output from the laser diode, the outputted gain being a gain selected from a plurality of gains which corresponds with a type of the optical signal output from the laser diode.

9. The apparatus of claim 8, further comprising an optical pickup controller and an output unit which adjusts a level of gain controlled signal output from the comparator to be compatible with a level of a signal input to the optical pickup controller and outputs the level-adjusted signal for use by the optical pickup controller.

10. The apparatus of claim 8, wherein the gain selector differentiates between when a first command is issued to output a preheating overpower to the laser diode and when a second command issued to output a write or a read power to the laser diode is issued, and issues a first gain when the first command is issued and a second gain when the second command is issued.

11. The apparatus of claim 10, wherein the first gain is set so that a predetermined cut-off voltage is output for when the detected optical power is substantially the overpower.

12. The apparatus of claim 10, wherein the second gain is set so that a predetermined cut-off voltage is output when the detected optical power is substantially the write or the read power.

13. The apparatus of claim 10, wherein the second gain is greater than the first gain.

14. The apparatus of claim 10, further comprising an optical pickup controller that outputs a power enable signal for driving the laser diode, wherein if the optical pickup controller outputs the power enable signal to be input to the laser diode, the gain selector issues the first gain, and if the power enable signal is not input to the laser diode, the gain selector issues the second gain.

15. The apparatus of claim 14, wherein the power enable signal is an overpower enable signal input into the laser diode from the optical pickup controller.

16. An optical pickup system which outputs and controls optical power used for driving a laser diode, comprising:

a monitor photo diode which selects a first gain selected from a first plurality of gains and which corresponds to a type of a disk to be driven according to an input signal, selects a second gain selected from a second plurality of gains and which corresponds to an optical power used for driving the laser diode, and adjusts a detected optical power using the selected first and second gains to produce a monitoring signal for use in driving the laser diode.

17. The optical pickup system of claim 16, wherein the first gain varies depending on whether the disk is a CD or a DVD, and the second gain varies depending on whether a first command is issued to output a preheating overpower to the laser diode or a second command is issued to output a write or a read power to the laser diode.

18. The optical pickup system of claim 17, wherein the second gain is set so that a predetermined cut-off voltage is output when the detected optical power is substantially the overpower when the first command is issued to output the overpower to the laser diode.

19. The optical pickup system of claim 17, wherein the second gain is set so that a predetermined cut-off voltage is output when the detected optical power is substantially the read or write power when the second command is issued to output the read or write power to the laser diode.

20. The optical pickup system of claim 16, wherein the monitor photo diode adjusts the second gain to be greater when a first command is issued to output a write or a read power to the laser diode than when a second command is issued to output an overpower to the laser diode.

21. The optical pickup system of claim 17, further comprising an optical pickup controller that transmits a power enable signal for driving the laser diode, wherein the second gain is selected using the power enable signal when transmitted from the optical pickup controller for driving the laser diode.

22. The optical pickup system of claim 21, further controlling a controller than transmits an overpower enable signal, wherein the second gain is selected using the overpower enable signal transmitted from the controller.

23. An apparatus for controlling a monitor photo diode, which monitors an optical signal output from a laser diode for writing data on or reading data from a disk, the apparatus comprising:

a comparator which compares a voltage signal corresponding to a detected optical power output from the laser diode with a predetermined reference voltage signal;

a medium gain selector which selectively issues a first gain selected from a first plurality of gains to the comparator depending on a type of the disk; and

an operation gain selector which selectively issues a second gain selected from a plurality of output gains to the comparator depending on a type of the optical signal output from the laser diode so as to issue a monitoring signal according to the issued first and second gains for use in controlling the laser diode, the output gains being multiplied by the output of the medium gain selector.

24. The apparatus of claim 23, wherein the medium gain selector issues as the first gain a third gain when the disk is a CD and a fourth gain other than the third gain when the disk is a DVD.

25. The apparatus of claim 23, wherein the operation gain selector issues as the second gain a third gain when a command is issued to output a preheating overpower to the laser diode and a fourth gain other than the third gain when a command is issued to output a write or a read power to the laser diode.

26. The apparatus of claim 25, wherein the third gain is set so that a predetermined cut-off voltage is output when the detected optical power is substantially the overpower.

27. The apparatus of claim 25, wherein the fourth gain is set so that a predetermined cut-off voltage is output when the detected optical power is the write or the read power.

28. The apparatus of claim 23, wherein the operation gain selector selects a greater gain from the second plurality of gains when a command is issued to output a write or a read power to the laser diode than a gain issued when a command is issued to output a preheating overpower to the laser diode.

29. The apparatus of claim 23, further comprising an optical pickup controller that transmits a power enable signal for driving the laser diode, wherein if the power enable signal is input to the laser diode from the optical pickup controller, the operation gain selector provides a gain for an overpower, and if the power enable signal is not input to the laser diode, the operation gain selector provides another gain for a write or a read power.

30. The apparatus of claim 29, wherein the power enable signal is an overpower enable signal input to the laser diode from the optical pickup controller.

31. An optical recording and/or reproducing system including the optical pickup system of claim 1 and further comprising a controller which controls the optical pickup system to transfer data with respect to the disk and which drives the laser diode according to the monitoring signal.

32. An optical recording and/or reproducing system including the apparatus for controlling the monitor of claim 8 and further comprising an optical pickup including the laser diode and a controller which controls the optical pickup to transfer data with respect to the disk and which drives the laser diode according to the gain controlled signal.

33. An optical recording and/or reproducing system including the optical pickup system of claim 16 and further comprising a controller which controls the optical pickup system to transfer data with respect to the disk and which drives the laser diode according to the monitoring signal.

34. An optical recording and/or reproducing system including the apparatus for controlling the monitor photo diode of claim 23 and further comprising an optical pickup having the laser diode and a controller which controls the optical pickup to transfer data with respect to the disk and which drives the laser diode according to the monitoring signal.

35. An apparatus for controlling a monitor photo diode, the apparatus comprising:  
a detection unit that determines a type of optical signal to be output from a laser diode, and adjusts a detected optical power signal output from the laser diode according to the determined type of the optical signal; and

a signal output unit which uses the adjusted optical power signal to generate a monitoring signal for use in maintaining a power level of the optical signal.

36. The apparatus of claim 35, wherein the detection unit receives an input signal corresponding to the type of optical signal to be output, selects an adjustment factor from a plurality of adjustment factors corresponding to the input signal, and adjusts the detected optical power signal according to the selected adjustment factor.

37. The apparatus of claim 36, wherein the input signal indicates a type of disk on which light emitted by the laser diode is being received, and the plurality of adjustment factors includes a first adjustment factor corresponding to a first type of disk and a second adjustment factor corresponding to a second type of disk other than the first type.

38. The apparatus of claim 36, wherein the input signal indicates a type of optical operation being performed by light emitted by the laser diode with respect to a disk, and the plurality of adjustment factors includes a first adjustment factor corresponding to an optical operation having a first maximum laser diode power level and a second adjustment factor corresponding to an optical operation having a second maximum laser diode power level other than the first maximum laser diode power level.

39. The apparatus of claim 38, wherein the first maximum laser diode power level corresponds to a preheating overpower operation, and the second maximum laser diode power level corresponds to a read or a write operation.

40. The apparatus of claim 35, wherein the determined type of the optical signal has a maximum power, and the detection unit adjusts the detected optical power as compared to the maximum power.

41. The apparatus of claim 40, wherein the monitoring signal has an inverse relationship with the maximum power such that, if the detected optical power is equal to or greater than the maximum power, a minimum signal is output.

42. The apparatus of claim 41, wherein the maximum power changes according to the type of optical signal such that, for a first type of optical signal, the maximum power is a first level, and for a second type of optical signal, the maximum power is a second level other than the first level.

43. The apparatus of claim 35, wherein:  
the detection unit adjusts the detected optical power using a first relationship for a first type of optical signal, and adjusts the detected optical power using a second relationship for a second type of optical signal, and  
the first relationship is other than the second relationship.

44. An optical recording and/or reproducing system including the apparatus for controlling the monitor photo diode of claim 35 and further comprising an optical pickup including the laser diode and a controller which controls the optical pickup to transfer data with respect to the disk and which drives the laser diode according to the monitoring signal.